C-AD

*R*adiation

*S*afety   Minutes of Radiation Safety Sub-Committee of June 19, 2001

*C*ommittee   **Requirements for Accelerating 60 Bunches in RHIC**

Present: L.Ahrens, A. Etkin, D. Beavis, A. Stevens

Present procedure limits the number of ion injected in an hour into a RHIC ring to $2.8*10^{11}$ Au ions per hour. There is a constraint to only accelerate six bunches. Presently, there are approximately $5*10^8$ Au ions per bunch. Present procedures are written to maintain two OSL limits given in C-A OPM 2.5.2. The OSL limits are 5 mrem in an hour for a controlled area and 0.5 mrem per hour in an uncontrolled area. The only uncontrolled area is the road (Railroad Ave.) over the RHIC berm.

L. Ahrens presented some results on monitoring beam loses using a new program, BLAM. This program monitors the potential total beam loss, which could create external radiation. It monitors the injected beam and also the amount of beam, which is cleanly ejected into the beam dumps. The program uses the energy of the beam to scale ($E^{.8}$) for estimated maximum dose. The alarm limits assume all beam is lost at a single point, and provides/alarms operators as to the maximum potential beam lost under a single point. There are still a few minor glitches in the program but these should be eliminated shortly. Additional upgrades would include the ability to use the loss monitor system to account for the loss pattern measured around the ring.

A limit of $5.6*10^{10}$ Au ions per hour has been proposed together with an allowance to accelerate 60 bunches. At 100 GeV this would correspond to 6.4 mrem in an hour on the berm. This presently requires three fills. Thus an occupancy factor of 1/3 is applied for a local loss. In addition, it is anticipated that in the arc section under the uncontrolled area where the road crosses the berm that no more than 20% of the beam would be lost in a localized area. This provides a reduction factor of 0.2. Therefore, the limit of $5.6*10^{10}$ Au ions per hour corresponds to a maximum potential dose of 0.4 mrem in an hour in an uncontrolled area.

L. Ahrens will review the operations procedure to ensure the correct limits are in place. The program BLAM must be running for the new limits to apply. The software must be archived following standard procedures. Finally, the committee would like to know that status of potential misfiring of the abort system and whether it is appropriate to implement protection if there is a misfiring. When these items are complete the machine will be ready for 60-bunch acceleration.
(CK-RHIC-FY2002-241)